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54 トナー補給装置

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明 細 書

1. 考案の名称

トナー補給装置

2. 実用新案登録請求の範囲

- 1) 補給用トナーが収容されるトナー容器の内部に、閉鎖方向に弾性体で付勢された、補給口を塞ぐための栓体を設け、補給ホッパの上部にあつて、前記トナー容器の倒立した状態で該トナー容器を取付けることができる受入部材の開口部に、上方に向つて弾性体で付勢されることにより受入部材の開口を閉鎖しかつ前記栓体を突上げて前記補給口を開放できる弁体を設けたトナー補給装置。

3. 考案の詳細な説明

本考案は電子写真複写機等のトナー補給装置に関する。

本明細書において、「トナー」の用語は二成分現像剤の静電トナーのみならず、一成分現像剤をも含む意味に用いる。

一般に、電子写真複写機においては、使用に伴

なつて消費されたトナーを補給する必要があるが、従来の補給用トナーは樹脂製のびんやアルミ箔袋に入れられているのが普通である。したがつて、従来では、開栓または開封したびん等から補給ホッパに補給用トナーを移しかえることになるけれども、その開栓時等に手が汚れたり、舞上つたトナーが室内に飛散したり、びん等に残つたトナーが周囲にこぼれる等の環境上及び衛生上の問題が引起こされている。

本考案は、以上に述べたような環境汚染及び衛生上の対策として、補給用トナーが収容されるトナー容器の内部に、閉鎖方向に弾性体で付勢された補給口を塞ぐための栓体を設け、補給ホッパの上部にあつて、前記トナー容器の倒立した状態で該トナー容器を取付けることができる受入部材の開口部に、上方に向つて弾性体で付勢されることにより受入部材の開口を閉鎖しかつ前記栓体を突上げて前記補給口を開放できる弁体を設けることを提案するものである。

以下、図面に示す実施例により本考案の詳細を

説明する。

第 1 図は本発明によるトナー補給装置の断面図であり、補給ホツパ 1 に補給用トナーを収容したトナー容器 2 を取付けた状態を示している。トナー容器 2 は合成樹脂材料で成形した広口びん型の容器本体 8 と、この容器本体 8 の口部 8 a にねじ込まれた筒状の口金部材 4 とから作られている。この口金部材 4 の内部には口金部材 4 の内周面に固定するスパイダ 5 及び投下口 6 に求心方向に突起させた指状片 7 により上下動可能に支持した栓体 8 が位置してある。栓体 8 は弾性体としての圧縮ばね 9 によつて下向きに付勢してあり、その中間部の栓 10 はもし、下からの押圧力が加わらない状態では口金部材 4 の座面 11 に着座されることにより投下口（補給口）6 を閉じることになる。

一方、前記補給ホツパ 1 の上部開口 12 は補給ホツパ 1 にねじ 18 で固定される受入部材 14 によつて閉鎖してあり、前記口金部材 4 の外形に対応させた受入部材 14（ここではロート状である。）の取付口 15 にはトナー容器 2 の口金部材 4 が嵌

合的に取付けることができる。そして前記取付口 15 の底部には開口 16 が穿たれ、この開口 16 を通つて補給ホツパ 1 の内部にトナーを投下できる。

前記開口 16 中には弁体 17 の突棒 18 が貫通され、この突棒 18 によつて前記栓体 8 を押開くことができる。弁体 17 は補給ホツパ 1 の穴 19 に上下動可能に支持されかつ前記圧縮ばね 9 よりも弱い圧縮ばね 20 で上向きに付勢された突棒 18 を有し、この突棒 18 の中間部には突棒 18 に外力が加わらないとき前記開口 16 を閉鎖する弁 21 を設けてある。

本考案によるトナー容器 2 は、以上のような構造であるから、口金部材 4 の投下口 6 は栓体 10 で常時閉じられているので、トナー容器 2 の持運び時や取扱い時に内部の補給用トナーがこぼれることはない。

また、トナー補給を行なうには、図示のように口金部材 4 を下にして受入部材 14 にトナー容器 2 を取付けるだけでよい。この場合、栓体 8 と突

棒 1 8 の衝合により弁体 1 7 が先ず押下げられ、受入部材 1 4 の開口 1 6 が開放され、突棒 1 8 が穴 1 9 の底面に突当たると、栓体 8 が口金部材 4 に対して上昇され、トナー容器 2 の投下口 6 が開放される。したがって、トナー容器 2 中の補給用トナーは投下口 6 を通つて開口 1 6 から補給ホツパ 1 中に自然流出するが、補給ホツパ 1 中がトナーで満たされている場合には、開口からの流出抵抗が大きいので、自然にその流出はとまる。なお、空になつたトナー容器を持上げると、栓体 8 は自動的に閉じるので、トナー容器 2 中に残つたトナーが周囲にこぼれることはない。

結局、本考案によれば、栓に全く手を触れずにトナー補給を行なえるから、指先等がトナーで汚れることがなく、トナー補給の際にトナーが外部に舞上つて周囲に飛散することがなく、容器中に残つたトナーが外部へこぼれることのないトナー補給装置を提供することができる。

4. 図面の簡単な説明

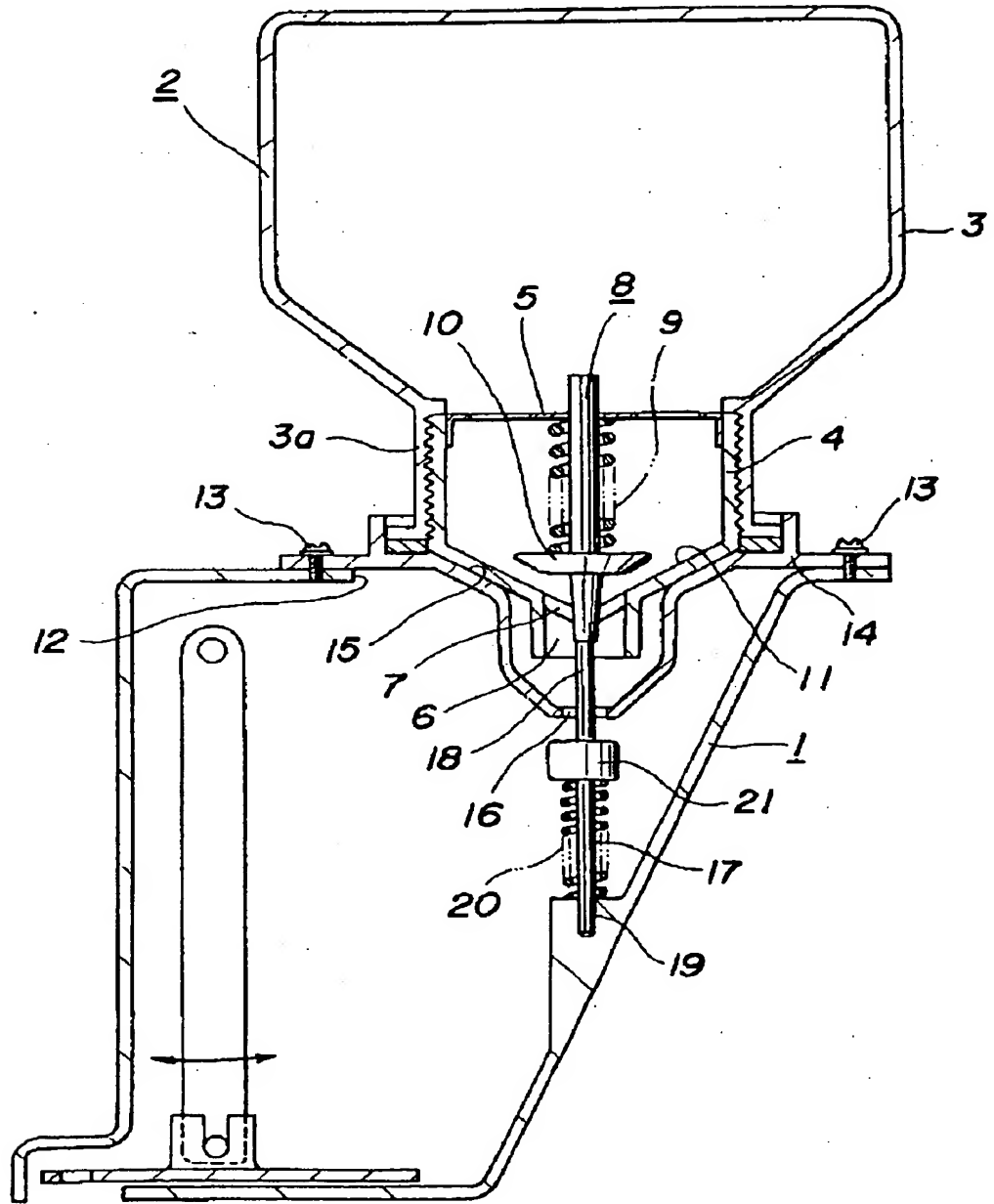
第 1 図は本考案によるトナー補給装置の全体

断面図である。

1 … 補給ホツバ、 2 … トナー容器、
8 … 栓体、 14 … 受入部材、 17 … 弁体。

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第 1 図



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DESCRIPTION

1. Title of the Device

Toner replenishing apparatus

2. Scope of Claim for Utility Model Registration

1) A toner replenishing apparatus, comprising: a plug member provided in an inner portion of a toner container accommodating replenishing toner, for closing the replenishing port, the plug member being urged by an elastic member in an closing direction; and a valve member provided to an opening portion of a receiving member which is located on top of a replenishing hopper and to which the toner container can be attached in an inverted state of the toner container, the valve member being capable of closing the opening of the receiving member when urged upward by an elastic member and opening the replenishing port by pushing up the plug member.

3. Detailed Description of the Device

The present device relates to a toner replenishing apparatus for an electrophotographic copying machine or the like.

The term "toner" as used herein refers to not only electrostatic toner of two-component developer but also that of one-component developer.

In electrophotographic copying machines, it is generally necessary to replenish toner that has been consumed through use. However, conventional replenishing toner is usually received in a bottle made of resin or an aluminum foil bag. Therefore, conventionally, replenishing toner is transferred from an unplugged or opened bottle or the like to a replenishing hopper. However, this process causes environmental and hygienic problems, such as the hand being stained with toner, the toner stirred up in the air scattering into the room, and the toner that remains in the bottle or the like spilling out to the surroundings, at the time of unplugging or the like of the bottle.

The present device proposes, as a countermeasure against the environmental and hygienic problems mentioned above, a structure including: a plug member provided in an inner portion of a toner container accommodating replenishing toner, for closing the replenishing port, the plug member being urged by an elastic member in an closing direction; and a valve member provided to an opening portion of a receiving member which is located on top of a replenishing hopper and to which the toner container can be attached in an inverted state of the toner container, the valve member being capable of closing the opening of the receiving member when urged upward by an elastic member and opening the replenishing port by pushing up the plug member.

Hereinbelow, the present device will be described in detail by way of its embodiment shown in the drawing.

Fig. 1 is a sectional view of a toner replenishing apparatus according to the present invention, illustrating a state in which a toner container 2 accommodating replenishing toner is attached to a replenishing hopper 1. The toner container 2 is composed of a wide-mouthed bottle type container main body 8 molded from a synthetic resin material, and a tubular mouthpiece member 4 pushed into a mouth portion 8a of the container main body 8. Located in an inner portion of the mouthpiece member 4 is a plug member 8 that is supported in a vertically movable manner by a spider 5 fixed to the inner peripheral surface of the mouthpiece member 4 and by a finger-like member 7 provided at a drop port 6 so as to protrude in the centripetal direction. The plug member 8 is urged downward by means of a

compression spring 9 as an elastic member. When not applied with a pressurizing force from below, a plug 10 located at the intermediation portion of the plug member 8 is seated on a seating face 11 of the mouthpiece member 4, thereby closing the drop port (replenishing port) 6.

On the other hand, a top opening 12 of the replenishing hopper 1 is closed by a receiving member 14 that is fixed to the replenishing hopper 1 with a screw 18. The mouthpiece member 4 of the toner container 2 can be fitted onto an attachment recess 15 of the receiving member 14 (which is funnel-shaped in this example) formed in conformity with the outer shape of the mouthpiece member 4. Further, formed at the bottom of the attachment recess 15 is an opening 16, through which toner can be dropped into the replenishing hopper 1.

An abutment bar 18 of a valve member 17 is penetrated through the opening 16, whereby the plug member 8 can be pushed open by the abutment bar 18. The valve member 17 has the abutment bar 18 that is supported in a vertically movable manner to a hole 19 of the replenishing hopper 1 and urged upward by means of a compression spring 20 exerting a smaller urging force than the compression spring 9. Provided at the intermediate portion of the abutment bar 18 is a valve 21 that closes the opening 16 when no external force is applied to the abutment bar 18.

Since the toner container 2 according to the present device is constructed as described above, the drop port 6 of the mouthpiece member 4 is closed by the plug member 10 at all times, whereby there is no fear of replenishing toner in the toner container 2 spilling out during carrying or handling of the toner container 2.

Further, as shown in the figure, toner replenishment can be performed by simply attaching the toner container 2 to the receiving member 14 with the mouthpiece member 4 facing down. In this case, first, the valve member 17 is pushed down due to butting engagement between the plug member 8 and the abutment bar 18, whereby the opening 16 of the receiving member 14 is opened; when the abutment bar 18 abuts against the bottom surface of the hole 19, the plug member 8 is raised with respect to the mouthpiece member 4, causing the drop port 6 of the toner container 2 to be open. Accordingly, replenishing toner in the toner container 2 passes through the drop port 6 for spontaneous outflow from the opening 16 into the replenishing hopper 1. When, at this time, the replenishing hopper 1 is filled with toner, a large resistance acts against the outflow from the opening, causing the outflow to stop spontaneously. It should be noted that the plug member 8 is automatically closed upon lifting up the toner container that has been emptied, whereby toner remaining in the toner container 2 does not spill out to the surroundings.

To conclude, according to the present device, toner replenishment can be performed without touching the plug with hand at all, thereby making it possible to provide a toner replenishing apparatus with which the fingertip or the like is not stained with toner, toner is not stirred up into the outside air to scatter to the surroundings, and toner remaining in the container does not spill out of the container.

4. Brief Description of the Drawings

Fig. 1 is a sectional view showing the entirety of a toner replenishing apparatus according to the present device.

1 ... replenishing hopper, 2 ... toner container, 8 ... plug member, 14 ... receiving member, 17 ... valve member.

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